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10/586,633	09/25/2006	Steinar Bjornstad	OSL-038	6061

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EXAMINER	
AGA, SORI A	

ART UNIT	PAPER NUMBER
2476	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/586,633	BJORNSTAD, STEINAR	
	Examiner	**Art Unit**	
	SORI A. AGA	2476	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 September 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment and accompanying remarks mailed 09/10/2010 have been entered and carefully considered. Claims 1 and 13 are amended. Claims 19 and 21 are cancelled. Claims 1-18 and 20 remain pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al.(US PG-PUB 2004/0151171 A1) (herein after Lee) in view of Ovadia et al. (US PAT 7,266,295 B2) (herein after Ovadia), Ohba et al. (US PAT 6,101,193) (herein after Ohba) and Ge et al. (US 6,819,870 b1) (herein after Ge).

Regarding claim 1, Lee teaches an optical switch within an asynchronous fiber optic communication network comprising, a plurality of fiber optic inputs, a plurality of fiber optic outputs having different wavelengths for wavelength division multiplexing **[see fig. 2 and paragraph 0037 where a large capacity optical router including an optical switch is showing having N input ports 1 to N (a plurality of fiber optic inputs); and**

N output ports (a plurality of fiber optic outputs); where the inputs and outputs are shown as wavelength-lambda (fiber optic). See also paragraph 0038 lines 1-6 where the input/outputs are shown as WDM (wavelength division multiplexed)],

and a buffer unit communicating with the inputs and outputs; and scheduling outputting of data the moment when a predefined number of wavelengths directed to a buffered destination are vacant **[See figure 2 and paragraph 0060 lines 19-24 where an a large capacity optical router including an optical switch is shown and where a determination is made to determine whether an available wavelength channel (at least one) exists and if there is no available wavelength channel, the data frame waits in the buffer].**

However, Lee does not explicitly teach the buffer unit has electronic variable delays, adjustable from below to above the duration of a packet; and that the predefined number is greater than one. However, Ovadia, in the same field of endeavor teaches queued packets of an optical network can be transferred in time slots that are allocated and distributed over multiple wavelengths (i.e. a predefined number of at least two); where the reserved time slots can be fixed duration or variable duration (have electronic variable delays) **[see column 5 lines 15-41]**. It would have been obvious for a person having ordinary skill in the art to include buffer unit having electronic variable delays, adjustable from below to above the duration of a packet; where the predefined number is greater than one. This is desirable because it allows the network to achieve increased bandwidth efficiency through TDM channels (see column 6 lines 44-46).

However, Lee does not explicitly teach that buffering data based upon reorganizing the data by assigning data packets according to ranges of length to different delay queues. However, Ohba teaches scheduling queues that each has a prescribed number (three) of packet length designated queues which are provided in correspondence to different packet length ranges **[see column 8 lines 50-58]**. It would have been obvious for a person having ordinary skill in the art to buffer data based upon reorganizing the data by assigning data packets according to ranges of length to different delay queues. This is desirable because it provides a packet witching that is capable of improving the fairness characteristics in a show time scale (see column 3 lines 10-15).

However, Lee does not explicitly teach data packets having shorter lengths have greater probability of encountering sufficient vacant outputs of different wavelength and data packets having longer lengths having lesser probability of encountering sufficient vacant outputs of different wavelength. However, Ge, in the same field of endeavor (optical switching) teaches incoming packet of an optical switch are sorted in ascending order based on the data packet size, wherein the shortest length data packet is processed first (i.e. the data packets having shorter lengths have greater probability of encountering vacant outputs of different wavelength) [see column 5 lines 26-36 - see also column 8 lines 6-23]. This is desirable because such optical switching system reduces dropping of variable length data packet due to blocking conflicts (see column 3 lines 34-37)

Regarding claim 2, Lee teaches the switch of claim 1 wherein the switch monitors to detect a number of vacant wavelengths at the switch outputs **[Lee Paragraph 0060 lines**

18-20 where a controller checks the state of the output wavelength channel]. However, Lee does not explicitly teach that the predefined number is greater than one. However, Ovadia, in the same field of endeavor teaches queued packets of an optical network can be transferred in time slots that are allocated and distributed over multiple wavelengths (i.e. a predefined number of at least two) **[see column 5 lines 15-41]**. It would have been obvious for a person having ordinary skill in the art to include buffer unit where the predefined number of wavelengths is greater than one. This is desirable because it allows the network to achieve increased bandwidth efficiency through TDM channels (see column 6 lines 44-46).

Regarding claim 3, Lee teaches the switch of claim1 as discussed above. However, Lee does not explicitly teach the data and buffered packets are classified according to one of (a) packet data length and (b) length of non-packet data. However, Ohba teaches arranging packets based on packet length **[see column 8 lines 62-65]**. It would have been obvious for a person having ordinary skill in the art to classify packets according to packet data length. This is desirable because it helps to make the network improve the fairness characteristics in a short time scale by suppressing the burstiness of traffic.

Regarding claim 4, Lee teaches the switch of claim 3 as discussed above. However, Lee does not explicitly teach at least one data packet with a length within a first range is associated with a first queue, a further data packet with a length within a second range is

associated with a second queue, and a still further packet with a length within a third range is associated with a third queue. However, Ohba teaches **[see column 8 lines 66-67 and column 9 lines 1-11 where packets with packet lengths with less than or equal to 100 bytes (first range) are entered into the packet length designated queue A1 or B1; and where packets with packet lengths with less than or equal to 300 bytes and more than 100 bytes (second range) are entered into the packet length designated queue A2 or B2; and where packets with packet lengths with less than or equal to 500 bytes and more than 300 bytes (third range) are entered into the packet length designated queue A3 or B3]** It would have been obvious for a person having ordinary skill in the art to classify packets according to packet data length. This is desirable because it helps to make the network improve the fairness characteristics in a short time scale by suppressing the burstiness of traffic.

Regarding claim 5, Lee teaches the switch of claim 1 wherein the buffer unit has inputs with data originating from lines external to the switch **[see figure 2 'inputs 1-n' and Paragraph 0037 lines 3-6 where the inputs for the optical router are incoming from an IP router (external lines)]**.

Regarding claim 6, Lee teaches the switch of claim 5 where the external lines are lines from aggregation inputs **[see paragraph 0031 and figs. 2 and 7].**

Regarding claim 7, Lee teaches the switch of claim 1, wherein the buffer unit has an input and the data, at the buffer unit input is routed from a one or more switch inputs [see **figure 2 'inputs 1-n' and Paragraph 0037 lines 3-6 where the inputs for the optical router are incoming from an IP router (switch inputs)**].

Regarding claim 8, Lee teaches the switch of claim 1, where the switch is selected to operate within one of the following networks among the group consisting of an optical packet switched network, an optical bursts switched network, an electronic packet switched network, a WDM network, and an electronic bursts switched network [see **paragraph 0003 lines 1-3 where the optical router exchanges data traffic such as IP packets in optical frames (optical packet switched network)**].

Regarding claim 9, Lee teaches the switch of claim 5, where the switch is an optical switching unit [see **figure 2 '40' and paragraph 0023 lines 1-4 where a large capacity optical router including a plurality of input ports is shown**].

Regarding claim 10, Lee teaches the switch according to claim 5, where the switch is an electronic switching unit [see **paragraph 0043 line 1 where the switch includes an electronic switch**].

Regarding claim 11, Lee teaches the switch of claim 7, where at least one of the output or input signals of the switch are WDM **[see paragraph 0038 lines 1-4 where the inputs are WDMs]**.

Regarding claim 12, Lee teaches the switch of claim 9, where the buffer is an electronic type of buffer **[see paragraph 0019 line 6 where the buffer is shown to be an electronic buffer]**.

Regarding claim 13, Lee teaches a method for organizing dataflows in an asynchronous communication network including at least one switch, where said switch is associated with at least one buffer having fiber optic inputs and outputs with a plurality of data queues and at least a dataflow that can be divided into data packets **[see fig. 2 and paragraph 0037 where a large capacity optical router including an optical switch is showing having N input ports 1 to N (a plurality of fiber optic inputs); and N output ports (a plurality of fiber optic outputs); where the inputs and outputs are shown as wavelength-lambda (fiber optic). See also paragraph 0038 lines 1-6 where the input/outputs are shown as WDM (wavelength division multiplexed)]**, comprising:

switching data packets arriving at the switch inputs directly to the switch outputs when a predefined number, being at least one, of wavelengths being monitored, is vacant, communicating data packets arriving at the switch inputs directly to the buffer unit, if none wavelengths are vacant, scheduling outbound data packets from the buffer unit to

the switch input the moment when a predefined number of wavelengths leading to a switch output destination being monitored to be vacant; **[See figure 2 and paragraph 0060 lines 19-24 where an a large capacity optical router including an optical switch is shown and where a determination is made to determine whether an available wavelength channel (at least one) exists and if there is no available wavelength channel, the data frame waits in the buffer];**

However, Lee does not explicitly teach that buffering data based upon reorganizing the data by assigning data packets according to ranges of length to different buffer queues. However, Ohba teaches scheduling queues that each has a prescribed number (three) of packet length designated queues which are provided in correspondence to different packet length ranges **[see column 8 lines 50-58]**. It would have been obvious for a person having ordinary skill in the art to buffer data based upon reorganizing the data by assigning data packets according to ranges of length to different buffer queues. This is desirable because it provides a packet witching that is capable of improving the fairness characteristics in a show time scale (see column 3 lines 10-15).

However, Lee does not explicitly teach that the predefined number is at least two. However, Ovadia, in the same field of endeavor teaches queued packets of an optical network can be transferred in time slots that are allocated and distributed over multiple wavelengths (i.e. a predefined number of at least two) **[see column 5 lines 15-41]**. It would have been obvious for a person having ordinary skill in the art to include buffer unit where the predefined number of wavelengths is greater than one. This is desirable

because it allows the network to achieve increased bandwidth efficiency through TDM channels (see column 6 lines 44-46).

However, Lee does not explicitly teach data packets having shorter lengths have greater probability of encountering sufficient vacant outputs of different wavelength and data packets having longer lengths having lesser probability of encountering sufficient vacant outputs of different wavelength. However, Ge, in the same field of endeavor (optical switching) teaches incoming packet of an optical switch are sorted in ascending order based on the data packet size, wherein the shortest length data packet is processed first (i.e. the data packets having shorter lengths have greater probability of encountering vacant outputs of different wavelength) [see column 5 lines 26-36 - see also column 8 lines 6-23]. This is desirable because such optical switching system reduces dropping of variable length data packet due to blocking conflicts (see column 3 lines 34-37).

Regarding claim 14, Lee teaches the method of claim 13 further defined by monitoring to schedule data from the buffer unit to an output of the switch **[Lee Paragraph 0060 lines 18-20 where a controller checks the state of the output wavelength channel]**. However, Lee does not explicitly teach the predefined number is at least two. However, Ovadia, in the same field of endeavor teaches queued packets of an optical network can be transferred in time slots that are allocated and distributed over multiple wavelengths (i.e. a predefined number of at least two) **[see column 5 lines 15-41]**. It would have been obvious for a person having ordinary skill in the art to include buffer unit where the

predefined number of wavelengths is greater than one. This is desirable because it allows the network to achieve increased bandwidth efficiency through TDM channels (see column 6 lines 44-46).

Regarding claim 15, Lee teaches the method of claim 13 further defined by buffering data packets into a number of queues according to parameters of the data packets **[see paragraph 0043 lines 1-4 where the input data is switched by destination (parameter of data packet) and sent to the buffers]**.

Regarding claim 16, Lee teaches the method of claim 13 as discussed above. However, Lee does not explicitly teach the method further comprises associating data packets with a length within a first range with a first queue. However, Ohba teaches **[see column 8 lines 66-67 and column 9 lines 1-2 where packets with packet lengths with less than or equal to 100 bytes (first range) are entered into the packet length designated queue A1 or B1]**. It would have been obvious for a person having ordinary skill in the art to classify packets according to packet data length. This is desirable because it helps to make the network improve the fairness characteristics in a short time scale by suppressing the burstiness of traffic.

Regarding claim 17, Lee teaches the method of claim 13 as discussed above. However, Lee does not explicitly teach associating data packets with a length within a second range with a second queue. However, Ohba teaches **[see column 9 lines 2-6 where packets with packet lengths with less than or equal to 300 bytes and more than 100 bytes (second range) are entered into the packet length designated queue A2 or B2]**. It would have been obvious for a person having ordinary skill in the art to classify packets according to packet data length. This is desirable because it helps to make the network improve the fairness characteristics in a short time scale by suppressing the burstiness of traffic.

Regarding claim 18, Lee teaches the method of claim 13 as discussed above. However, Lee does not explicitly teach the method further comprises associating data packets with a length within a third range with a third queue. However, Ohba teaches **[see column 9 lines 6-10 where packets with packet lengths with less than or equal to 500 bytes and more than 300 bytes (third range) are entered into the packet length designated queue A3 or B3]**. It would have been obvious for a person having ordinary skill in the art to classify packets according to packet data length. This is desirable because it helps to make the network improve the fairness characteristics in a short time scale by suppressing the burstiness of traffic.

Regarding claim 20, Lee teaches the method of claim 19 as discussed above. However, Lee does not explicitly teach the predefined number of vacant wavelengths is specific to each queue. However, Ohba teaches scheduling queues that each has a prescribed number (specific to each queue) of packet length designated queues which are provided in correspondence to different packet length ranges **[see column 8 lines 50-58]**. It would have been obvious for a person having ordinary skill in the art to buffer data based upon reorganizing the data by assigning data packets according to ranges of length to different delay queues. This is desirable because it provides a packet witching that is capable of improving the fairness characteristics in a show time scale (see column 3 lines 10-15).

Response to Arguments

4. Applicant's arguments with respect to claims 1-18 and 20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SORI A. AGA whose telephone number is (571)270-1868. The examiner can normally be reached on M-F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz R. Sheikh can be reached on (571)272-3795. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. A. A./
Examiner, Art Unit 2476

/Salman Ahmed/
Primary Examiner, Art Unit 2476